



VARIOUS METHODS USED IN COMPUTER AIDED KNOWLEDGE DELIVERY SYSTEMS TO IMPROVE EFFICIENCY

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ABSTRACT

Teachers have been teaching their students by introducing text books along with verbal instructions in traditional education system. But the teaching methods are being greatly changed and influenced by the innovation in the technology. The aim of this paper is to study various computer aided methods which are being used widely in education sector for betterment of teaching and learning process to spread the awareness among the involved stakeholders. This paper also states that how new computer aided teaching-learning methods can be used in the education field. This paper also focuses on the limitations and disadvantages of the Computer Aided Teaching-Learning.

KEYWORDS: Computer: Aided Teaching-Learning, Computer Assisted Instruction (CAI), Interactive Teaching-Learning.

1. INTRODUCTION

The current era is the information age or computer age or digital age. In the information, the world has almost become a global village. It has changed business, industry, government and education.

Quality education is the basic need of every individual. Traditional courses are being replaced by professional courses and curriculum has also been advanced as per the latest trends in the industry. Traditional teaching is no longer effective to complete the curriculum within the stipulated time period. There is a great need of some teaching aids to teach the curriculum within the time limit. This leads to the computers aided teaching and learning. Computer aided teaching is an interactive teaching and has many advantages over traditional teaching and learning.

India may not be the early adopter of the new technology in the education sector, but access to the high speed internet, low cost computers and mobile devices here has been a remarkable growth. Here are various tools and methods discussed which may be adopted while teaching and learning to excel the process.

1. Social platform for a classroom to interact online:

In peer to peer learning is one of the educational practices in which student interact with another student to achieve an education goal. A class should continue after to interact and learn collaboratively even after class hours. This idea led to the social learning platforms to come up.

Example: Student can create learning resources, notes and share with each other. This can be a great help to the students from the small towns conversant with the computer coming with the solution for themselves. This is the power of social learning platform.

There are many social learning platforms like Grockit.com, remixlearning.com, pagalguy.com.

The advantages of social learning: Vicarious Learning, direct learning from others, knowledge sharing, Conversational learning, orchestrated learning, Shared knowledge building,

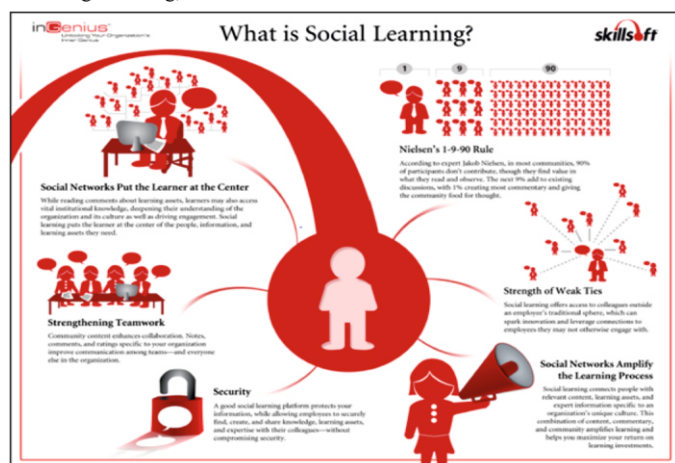


Fig. 1. Social Learning platform

2. Online learning management systems:

Online learning allows learners to learn via internet instead of learning in a physical classroom. Online learning through the Internet is used to deliver content, track progress of learners and sometimes to administer exams and provide certificates to the learner for the successful completion of the course. Many websites allow the learner to download content (like iTunes U)

Example 1: iTunes U provides everything an instructor needs to bring the classroom together with computer/iPad build lessons with apps and your own materials, collect and grade assignments from students, discuss one-to-one or in groups, and annotate PDF assignments.

Example2: Udemy.com is a platform or marketplace for online learning. [1]. Udemy.com provides a platform for experts of any kind to create courses which can be offered to the public, either at no charge or for a tuition fee [2]. Several courses are currently available on udemy.com. It allows user to buy online course for lifetime by paying once and also tracks the progress of the learning. Udemy like online platforms are Coursera.com, Lynda.com, Udacity.com, khanacademy.com, Skillshare.com. Fig.2 illustrates online learning using Internet.

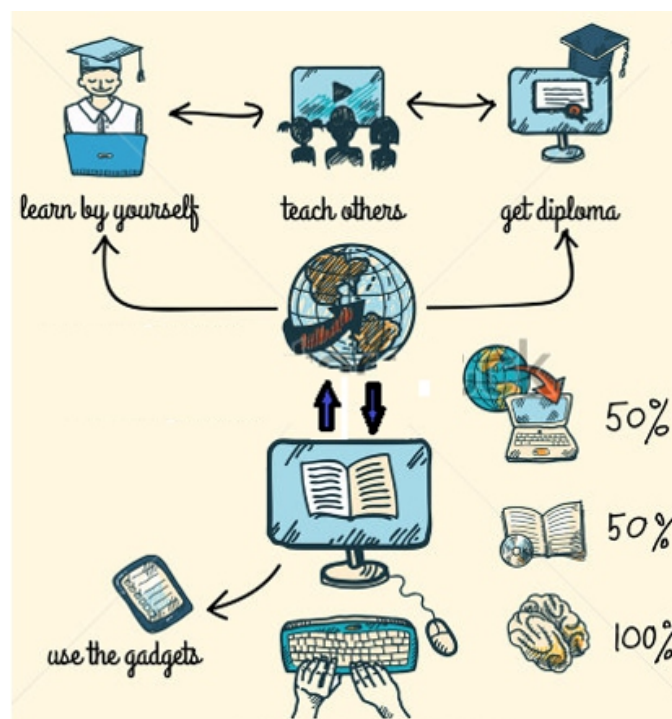


Fig. 2. Online education e-learning with
(<http://www.shutterstock.com>, Image ID:194672063)

3. Mobile based learning management system:

More people have access to the smart phones with high speed broadband connection. This is the reason that there is a big investment in the mobile based learning technology.

Mobile based courses have to be optimized for a smaller screen, lower computing power, and slower internet since mobiles have, the less computing storage power compared to the computers.

It can be said that the mobile learning is a natural extension of the e-learning. One of the main advantages of M-learning is its possibilities to improve students' productivity by making knowledge and learning available anytime and anywhere, enabling learners to participate in learning activities without the traditional place and time restrictions. Mobile learning allows the learner to manage different learning requirements, allowing student to get knowledge at their own speed.

Advantages:

- Anywhere, anytime access to the contents.
- Support distance learning.
- Allows two ways learning that enhances the confidence of shy, hesitant, reserved students and differently-Abled.
- Great for just-in-time training or review of content.
- Support the choice for student learning needs and personalized learning.
- Can enhance interaction between and among students, learners and instructors. [3]

4. Gamification of learning:

Gamification, broadly defined, is the process of defining the elements which comprise games that make those games fun and motivate players to continue playing, and using those same elements in a non-game context to influence behavior.[7]. Gamification must be used in collaboration of other electronic tools it should not be seen isolated with other tools and methods. There are three basic parts in most games: goal-focussed activity, reward mechanisms, and progress tracking (Dickey, 2005)[15]

The gamification of learning is an educational approach to motivate students to learn by using video game design and game elements in learning environments. There are many evidences where video games are successfully deployed to facilitate language learning. One advantage of playing massively multiplayer online role playing games (MMORPG) helps to reduce anxiety levels and encourages to take risk using the target language (Reinders & Wattana, 2014). [4] [5].

Gamification must capture and retain learners' attention, challenge them, engage and entertain them and at the end teach them as a goal.

Gamification technique motivates the natural desire like competition, achievement, status self-expression, altruism, and closure. The main strategy of gamification is to reward the participant like points, levels achievement badges, filling progress bar or providing user with virtual currencies.[15]

Another approach to gamification is to convert real task in the game which will be played as the game but the real work is being done. Some of the techniques that can be added is a meaningful choice, onboarding with a tutorial, increasing challenge, and adding narrative. [8]. Gamification is illustrated in fig. 3 as shown below

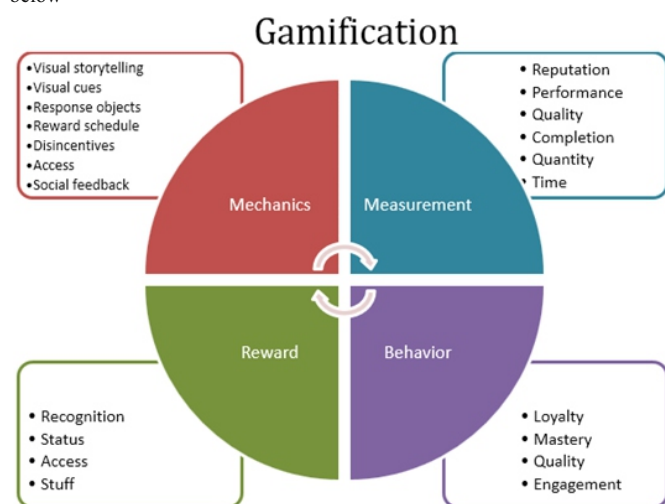


Fig. 3 Framework for Gamification Model
(<https://www.coetail.com>)

5. Electronic classroom:

Electronic classroom is the room with computers and display. It must have the following elements [16]

- Workstation for instructor
- Multimedia system with audio video support
- Database of educational materials
- A workstation for each student
- All workstations are connected in local network
- Telecommunication system to connect other resources outside the classroom.

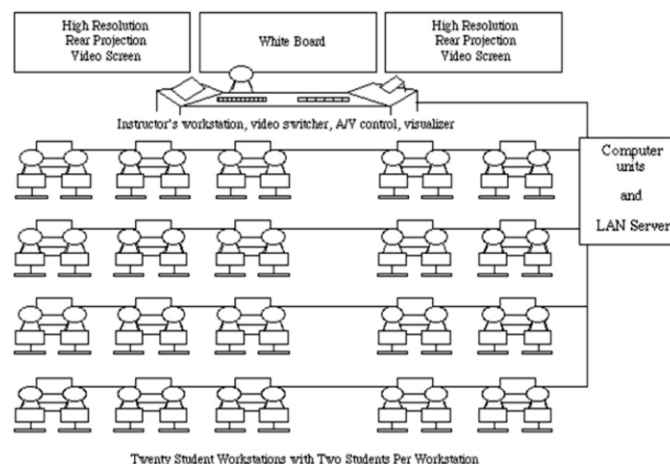


Fig.4 A schematic of the AT&T Teaching Theater, showing the displays at the front of the classroom, the instructor's console, the local area network (LAN) and two students at each of the 20 workstations.
(<http://lap.umd.edu/soc/ch1/ch1.html>)

6. Online textbook and depositories:

This contains several books in the digitized form. It has been proven that the business model that is cheaper and cost effective to give the selective access to the contents of the book. Publishers have also noticed the growth in the revenue while online access is given to the users. This model also helps to avoid the piracy of textbooks.

7. Online Journal depositories:

Online Journal depositories provide access to the subject specific research papers published online and are available online for free. Teachers and learners can find research paper of their field to get updated knowledge. Many journals are open source available to all.

8. Flapped class room:

One trend has come up of "flapped classroom", where students watch video lectures as homework and then class hours are utilized for discussion.

The findings published in Academic Medicine Journal and The American Journal of Pharmaceutical Education found that, with flapped classroom model, students did better than the in class lecture model. This model saves class time and that can be used for dialog and interactive projects.

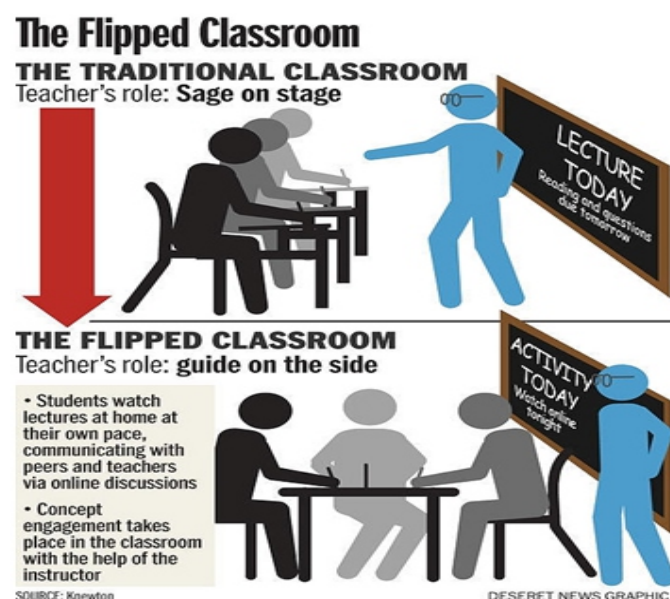


Fig.5 Flapped class room

9. Flash notes:

Some students are interested to prefer their own notes rather than class notes. Would you be more motivated if you knew that your notes would not only give you an edge on the exam, but could also earn you a bit of cash?

Flash notes allows students to develop and upload their own notes and the neediest students buy them. The rating system allows the best notes to be preferred over the lower rating notes that leads to get more business and quality improvement. The pool of knowledge expands as students continue to share the notes among each other.

10. Lore Platform:

Lore is a Facebook type of platform that allows teachers to create their own educational website for the course. This software facilitates instructor to share their notes, collect assignments and allows the students to follow the instructor. Students can ask questions to the instructor and get the answers. It also allows students to discuss, share contents and chat with one another.

11. Computer Simulation:

Computer simulation model runs on a single computer or on a computer network to reproduce behaviour of a real life system. The simulation uses an abstract computer model to simulate the real life system. It provides the insights of a real world elements being studied. Computer simulation model is developed by using computer programming. Some situations where computer simulation can be used are:

Real systems: Flight simulator, Train simulator, production system, and nuclear adapter.

System which are impossible to build: Natural economy, biological system.

Mathematical modelling: stochastic problems, non-linear differential equation [10].

Advantages:

- Allowing experience without disrupting to existing system. Example. Adding and testing equipment to the machinery for their functionality.
- Concept can be tested prior to installation to avoid further complications on real system. Example: Automatic storage and retrieval system (ASRS)
- Detection of an unseen problems: Example. Traffic light simulation
- Gain in knowledge and experience on system.

Disadvantages:

- It is time consuming to build as per the real system.
- The results are only approximate. No such a system yields 100% accurate result.
- Difficult to validate because output produced is only abstract.

12. Computer Animation:

Animation is one of the important tool in classroom teaching and learning. Learning with animation can increase the interest and motivation in learning [11].

Many companies and production houses already started producing animated materials used for teaching and learning. As the education and training industry is massive, there is a great demand of such a type of material.

The animation content in the classroom can be classified in three main types [12]:

1. Expositive: the users watch the expository content on screens
2. Interactive: the users can interact with the content at a higher level
3. Quizzes: the users are tested on a specific content

13. Virtual Manipulative

The National Library of Virtual Manipulative (NLVM) is a Web-based collection of interactive tools for k-12 math instruction.

The NLVM has collection of over 100 interactive software programs, called "applets," are an effective means for accelerating and deepening students' understanding of math. These tools are developed in such a way that they engage students with math concepts based on the constructivist model. Manipulative can be considered alternatives to the teacher. Manipulative encourages independent practice because these tools are available online with open access [14].

14. Remote delivery based classrooms:

In this method an expert delivers lecture from one place and the same is broadcasted at different places. Example: Lecturer sitting in US can be utilised for the study in various countries using live streaming. This can be used where the rare talent is not available locally. The scope of this method is very broad as compare to classroom lecture. Learners can also participate and ask questions through this method.

CONCLUSION:

Today everyone is talking about 'Digital India', wave of digitalisation has already started to blow, and major economies of the world started eyeing our nation as potential hub for investment. Nation has shown great progressive approach. This has put great responsibility on education. To make the nation realise the dream of digitalization education has to play important role by encouraging the use of electronic devices in teaching learning process. And we are confident soon we will have digital India and every individual will be able to take part making such dream come true. Stating again that the use of innovative modern techniques in teaching learning process empowers us at global level to compete with world's biggest or mighty economies such America, China etc.

The conclusion that can be drawn from this paper is that there are many computer aided models and tools available for the teaching and learning process. One can go through all these models and pick up the best of his/her choice.

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